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SAAD WASTE OIL SITE
Nashville, TN
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Table 1. Volatile Organics in Water (Cont'd)

Concentrations reported in ug/L

Sample No.	Parameter	Concentration
5711 (Diluted 10x)	Vinyl chloride	140.
	1,1-Dichloroethane	39.*
	trans-1,2-Dichloroethene	560.
5712	Methylene chloride	1.*
	Chloroform	2.*
	1,1,1-Trichloroethane	2.*
	Trichloroethene	2.*
5713	Vinyl chloride	18.
	Chloroethane	13.
	Methylene chloride	1.*
	Acetone	68.
	1,1-Dichloroethane	33.
	trans-1,2-Dichloroethene	14.
	2-Butanone	9.*
	1,1,1-Trichloroethane	8.
	Total xylenes	9.
5714 (Diluted 50x)	Methylene chloride	2500.
	1,1-Dichloroethane	110.*
	trans-1,2-Dichloroethene	4100.
	Trichloroethene	5000.
	4-Methyl-2-pentanone	210.*
	Toluene	4100.
	Ethyl benzene	110.*
	Total xylenes	310.
5715 (Diluted 25x)	Vinyl chloride	350.
	Methylene chloride	53.*
	1,1-Dichloroethane	81.*
	trans-1,2-Dichloroethene	1800.
	Toluene	210.

*denotes a value below the limit of quantification that is considered approximate.

Table 1. Volatile Organics in Water

Concentrations reported in ug/L

Sample No.	Parameter	Concentration
5705	Methylene chloride	200.*
(Diluted 100x)	Carbon disulfide	110.*
	1,1-Dichloroethane	120.*
	trans-1,2-Dichloroethene	1200.
	Toluene	7500.
	Ethyl benzene	250.*
	Total xylenes	1100.*
5706	Vinyl chloride	280.
(Diluted 20x)	1,1-Dichloroethane	67.*
	trans-1,2-Dichloroethene	1900.
	Toluene	360.
	Total xylenes	150.*
5707	Vinyl chloride	120.
(Diluted 10x)	1,1-Dichloroethane	55.
	trans-1,2-Dichloroethene	420.
	Toluene	1100.
	Ethyl benzene	180.
	Total xylenes	1500.
5708	Vinyl chloride	22.
(Diluted 2x)	1,1-Dichloroethane	14.
	trans-1,2-Dichloroethene	270.
5709		
(Diluted 50x)	Benzene	55.*
	Toluene	4000.
	Ethyl benzene	120.*
	Total xylenes	880.
5710	Vinyl chloride	64.
(Diluted 5x)	1,1-Dichloroethane	78.
	trans-1,2-Dichloroethene	63.
	Benzene	7.*
	Toluene	88.
	Ethyl benzene	220.
	Total xylenes	1900.

*denotes a value below the limit of quantification that is considered approximate.

Table 2. Results of Pesticides/PCBs in Water

Concentrations reported in ug/L

Sample No.	Parameter	Concentration
Method Blank	None detected	--
5705	None detected	--
5706	None detected	--
5707	4,4'-DDT	.56
5708	None detected	--
5709	None detected	--
5710	None detected	--
5711	None detected	--
5712	None detected	--
5713	None detected	--
5714	None detected	--
5715	None detected	--

Table 2. Results of Pesticides/PCBs in Water

Concentrations reported in ug/L

Sample No.	Parameter	Concentration
Method Blank	None detected	--
5705	None detected	--
5706	None detected	--
5707	4,4'-DDT	.56
5708	None detected	--
5709	None detected	--
5710	None detected	--
5711	None detected	--
5712	None detected	--
5713	None detected	--
5714	None detected	--
5715	None detected	--

Table 3. Volatile Organics in Soil

Concentrations reported in ug/kg

Sample No.	Parameter	Concentration
B-8 R1 10-13 (Diluted 2x)	Methylene chloride	16.
	trans-1,2-Dichloroethene	8.*
	2-Hexanone	23.*
	Toluene	54.
	Total xylenes	120.
B-20 3-4.1 (Diluted 100x)	Acetone	810.*
	Toluene	3900.
	Ethyl Benzene	610.*
	Total Xylenes	3700.
B-16 R1-14 (Diluted 2x)	Acetone	340.
	2-Butanone	71.
	4-Methyl-2-pentanone	38.
	Toluene	100.
	Ethyl benzene	7.*
	Total xylenes	23.
B-16 R2 BOB	Acetone	800.
	2-Butanone	96.
	4-Methyl-2-pentanone	49.
	Toluene	3.*
B-2 S-5	Acetone	22.
	trans-1,2-Dichloroethene	2.*
	Benzene	5.*
	4-Methyl-2-pentanone	33.
	Ethyl benzene	95.
	Total Xylenes	330.
B-4 4'-5' (Diluted 2x)	Ethyl benzene	110.
	Total xylenes	590.
B-16 R1 2.5 (Diluted 250x)	Acetone	1100.*
	Toluene	53000.
	Ethyl benzene	4600.

*denotes a value below the limit of quantification that is considered approximate.

Table 3. Volatile Organics in Soil (Cont'd)

Concentrations reported in ug/kg

Sample No.	Parameter	Concentration
B-35 S-2 6.5-8.5 (Diluted 10x)	1,1-Dichloroethane	19.*
B-24 R1 6.5-8.5 (Diluted 10x)	Methylene chloride	38.*
	2-Hexanone	270.
	Ethyl benzene	380.
B-13 4.5-6 (Diluted 100x)	Methylene chloride	950.
	Acetone	1200.*
	1,1-Dichloroethane	18000.
	trans-1,2-Dichloroethene	13000.
	1,1,1-Trichloroethane	28000.
	Trichloroethene	930.
	4-Methyl-2-pentanone	530.*
	Tetrachloroethene	3200.
	Toluene	29000.
	Ethyl benzene	2200.*
	Total xylenes	9800.

*denotes a value below the limit of quantification that is considered approximate.

Table 4. Pesticides/PCBs in Soil

Concentrations reported in ug/g

Sample No.	Parameter	Concentration
B-2 S-5	None detected	---
B-4 4-5	None detected	---
B-8 R-1 10-13	None detected	---
B-13 4.5-6	None detected	---
B-16 R-1 2.5	None detected	---
B-16 R-2 BOB	None detected	---
B-16 R-1 14	None detected	---
B-20 3-4.1	None detected	---
B-24 R-1 6.5-8.5	None detected	---
B-35 S-2 6.5-8.5	None detected	---

Table 5. Volatile Organics in Oil

Concentrations reported in ug/g

Sample No.	Parameter	Concentration
Method Blank	Acetone	32.
	2-Butanone	31.
5719	Methylene chloride	13.
	1,1-Dichloroethane	3.*
	1,1,1-Trichloroethane	22.
	Trichloroethene	20.
	Tetrachloroethene	2.*
	Toluene	33.
	Ethyl benzene	5.*
	Total xylenes	9.
5720	Methylene chloride	19.
	1,1-Dichloroethane	4.*
	2-Butanone	12.
	1,1,1-Trichloroethane	24.
	Trichloroethene	32.
	Toluene	32.
	Ethyl benzene	5.*
	Total xylenes	9.
1258	Methylene chloride	6.
	Acetone	1200.
	2-Butanone	2900.
	Trichloroethene	43.
	4-Methyl-2-pentanone	68.
	Toluene	8.
1260	Methylene chloride	220.
	1,1,1,-Trichloroethane	9.
	Trichloroethene	98.
	4-Methyl-2-pentanone	15.
	Toluene	170.
	Total xylenes	11.
1261	None detected	--

*denotes a value below the limit of quantification that is considered approximate.

Table 6. Results of Pesticides/PCBs in Oil

Concentrations in ug/g

Sample No.	Parameter	Concentration
1258	None detected	--
1258 (Duplicate)	None detected	--
1260	None detected	--
1261	None detected	--
5719	None detected	--
5720	None detected	--

Table 7. Results of Base Neutral/Acid Extractables in Oils

Concentrations reported in ug/g

Sample No.	Parameter	Concentration
Method Blank	None detected	--
1258	None detected	--
1260	bis(2-Ethylhexyl)phthalate	474.
1261	bis(2-Ethylhexyl)phthalate	1.1
1261 (Duplicate 1)	None detected	--
1261 (Duplicate 2)	Phenanthrene	0.11*
	bis(2-Ethylhexyl)phthalate	3.9
5719	Naphthalene	44.
	2-Methylnaphthalene	110
	Phenanthrene	21.
	Fluorene	15.
5720	None detected	--

* denotes a response that is below the limit of quantification and considered approximate.

Table 8. Results of Metals in Oil Analysis

Concentrations reported in ug/g

Parameter	Concentration					
	Detection Limit	5719	5720	1258	1260	1261
Antimony	2.0	ND	ND	ND	ND	ND
Arsenic	1.0	ND	ND	ND	4.9	ND
Beryllium	0.1	ND	ND	ND	ND	ND
Cadmium	0.5	0.84	0.81	0.82	0.64	0.66
Chromium	0.4	7.58	7.86	20.6	76.6	14.1
Copper	0.5	28.4	27.3	33.5	3.3	13.7
Lead	3.5	574.	728.	549.	25.8	136.
Mercury	0.1	0.28	ND	ND	ND	ND
Nickel	0.75	3.3	2.6	1.4	4.3	2.9
Selenium	0.5	ND	ND	ND	ND	ND
Silver	0.25	ND	ND	ND	ND	ND
Thallium	*	ND	ND	ND	ND	ND
Zinc	0.15	304.	315.	218.	63.6	147.

ND denotes not detected.
*Detection limits for thallium varied due to background corrections for matrix effects.

Table 9. Incineration Testing for Oil

Sample No.	Flashpoint oF	% Ash	BTU/ pound	Total organic Halogens*
5719	<70	0.31	9350.	0.20
5720	<70	0.23	8500.	0.26
1258	<72	0.25	0	0.09
1260	<70	0.81	15300.	0.55
1261	<72	0.03	500.	0.09

*TOX values reported as % chlorine.

INTRODUCTION

On March 20, 1987, five oil samples were sent to Versar Laboratory in Virginia from the Saad Waste Oil Site in Nashville, Tennessee. Priority pollutant volatile organics, PCBs, pesticides, base-neutral/acid extractables, and metals plus, incineration parameters (TOX, BTU, ash, and ignitability) analyses were performed. On March 23, seven water samples and ten soil samples were submitted to Versar for priority pollutant volatile organics and pesticides/PCBs analyses. Sample No. B-16,R-2 BOB is erroneously listed on the chain of custody records as a water sample; it is in fact a soil sample.

ANALYTICAL PROCEDURES

WATER

Volatile Organics: The volatile organics analyses were conducted according to Contract Laboratory Program (CLP) protocols. Most samples required dilution due to high concentrations of the parameters of interest. The method blanks for these analyses contained methylene chloride and acetone. The background for these compounds was subtracted from samples showing a positive response. Results are presented in Table 1. CLP criteria for calibration linearity were met for all compounds. Instrument detection limits were also acceptable. Detection limits varied for these samples due to the dilutions. Detection limits for each sample can be located in Section III. They are provided in the form of CLP sample reporting data sheets. Also included in this section are the listings of tentatively identified compounds. These compounds do not meet CLP criteria for identification and should be used with discretion.

Pesticides/PCBs: The pesticides/PCB analyses were conducted according to EPA Method 608 of the Federal Register. Results are presented in Table 2. All samples were analyzed as low level and met all detection limit criteria established by CLP. PCBs were undetected in all samples. 4,4'-DDT was found in sample 5707 but the chromatography was poor on both columns and Versar strongly suggests that this may be a false positive. In addition, since the linearity of DDT exceeded CLP limits, this result is somewhat questionable. No results are reported for sample 5708. The original analysis of the water samples indicated "overactivated" sorbent was used to clean the sample extracts and the extraction and analysis of the samples were repeated. Sample 5708 was expended during the initial analysis. The holding times for the extraction of the samples was exceeded.

SOILS

Volatile Organics: These analyses were conducted according to CLP

protocols. The soils contained various levels of volatile compounds and detection limits varied accordingly. The detection limits for each sample are provided in Section IV in the form of CLP data sheets. Also included in this section are listings of tentatively identified compounds. These compounds do not meet CLP criteria for identification and should be used with discretion. All compounds met CLP standards for calibration linearity and detection limits. The results are presented in Table 3.

Pesticides/PBCs: Samples were prepared and analyzed according to EPA Method 8080. Pesticides and PCBs were undetected in these samples. Results are presented in Table 4.

OILS

Volatile Organics: Samples were prepared by diluting one gram of oil in one milliliter of methanol. Sample extracts were analyzed by direct injection of a 1 ul aliquot onto the column to the GC/MS. The methanol blank contained acetone and 2-butanone. This background was subtracted from any sample hits for these compounds. Calibration range linearity was within CLP limits for all compounds except acetone and 2-butanone, probably due to the presence of these compounds in the methanol. In addition, the concentration of acetone and 2-butanone in Sample 1258 exceeded the linear calibration range and should be considered approximate. Redilution of this sample was not possible since only a small oil layer was present in the sample container and it was expended during the initial dilution. Results are presented in Table 5. Section V contains a listing of tentatively identified compounds. These compounds do not meet CLP criteria for identification and should be used with discretion.

Pesticides/PCBs: The samples were prepared and analyzed according to EPA Method 8080. Pesticides and PCBs were undetected in these samples as shown in Table 6. Linearity criteria as established by CLP were not met for alpha-BHC, delta-BHC, gamma-BHC, aldrin, 4,4'-DDT and methoxychlor. All other parameters were within the CLP limits. Detection limits were also met. Results are presented in Table 6.

Base Neutral/Acid Extractables: The samples were prepared according to EPA Method 8270. Sample analyses were conducted according to CLP protocol. All detection limit and linearity criteria were met with the exception of benzoic acid. Linearity for this compound exceeded the 35% relative standard deviation limit. Results are presented in Table 7. Section IX contains a list of tentatively identified compounds. These compounds did not meet CLP criteria for identification and should be considered as marginally accurate. Sample 1261 was analyzed in triplicate. Phenanthrene was detected in one of the three analyses. Bis(2-ethylhexyl)phthalate was detected in two of the three analyses. The analysis of one 1261 sample did not confirm the presence of either compound but GC/MS data for tentatively confirmed compounds indicate that they may be present. The analysis of these samples was complicated due to high

concentrations of numerous hydrocarbons which created background interferences.

Metals: Samples were analyzed according to EPA Methods 6010, 7060, 7470, and 7740 for priority pollutant metals. All calibration and linearity criteria were met. Results are presented in Table 8.

The results of the incineration parameter testing are presented in Table 9.

QA/QC PROCEDURES

Volatile Organics: All water, soil and oil samples were spiked with three surrogate standards. In the case of water and soil samples, these surrogate standards were used to assure the efficiency of the purge and trap unit. For the oil samples, the surrogates were used to establish the extraction efficiency. The surrogate standard recoveries are presented in QA/QC Table 10. All recoveries were within CLP advisory limits.

Two water samples were spiked in duplicate with a five component volatile organics mixture to determine the presence of any matrix interferences. All compounds were within the advisory limits established by CLP. Results are presented in QA/QC Table 11.

One soil sample and one oil sample were spiked with a five component volatile organics mixture. All recoveries were within CLP advisory limits. Results are presented in QA/QC Table 12 for the soil sample and QA/QC Table 13 for the oil.

Pesticides/PCBs: All water, soil and oil samples were spiked with a surrogate standard, dibutylchlorendate, to assure extraction efficiency. These results are presented in QA/QC Table 14. One water sample, 5706, showed a low recovery of 23%. The laboratory provided no possible cause. The soil samples showed recoveries in excess of 150% for 9 out of 12 analyses. The analysis of the soil samples for volatile organics by GC/MS indicates elevated concentrations of hydrocarbons which are the most likely reason for the high surrogate recoveries for the pesticides. The oil samples also showed high recoveries for samples 1260, 1261, 5719, and 5720.

Two water samples, 5712 and 5709, were spiked in duplicate with a three component mixture of pesticides. Five of six recoveries for these compounds in sample 5712 exceeded the CLP advisory limits. Six of six recoveries for sample 5709 exceeded 200%. The laboratory suggested that this sample may have been "double spiked". These results are presented in QA/QC Table 15.

One soil sample, B-16 R-2 BOB, was spiked with a six component pesticide mixture. All recoveries were within the CLP advisory limits except 4,4'-DDT which had a 155% recovery. The linearity of the 4,4'-DDT was unacceptable throughout these analyses. The results are presented in QA/QC Table 16.

One oil sample, 1258, was spiked with a six component pesticide mixture. Again, all recoveries, except 4,4'-DDT, were within CLP advisory limits. The results are reported in QA/QC Table 17.

No PCB matrix spikes were performed.

Base Neutral/Acid Extractables: The oil samples were spiked with three base neutral surrogate standards and three acid surrogate standards. The recoveries were within CLP advisory limits for all surrogates in all samples except sample 5719. Sample 5719 showed elevated recoveries for all but one surrogate. These results are presented in QA/QC Tables 18A and 18B.

Metals: One oil sample, 1261, was analyzed in duplicate to determine matrix homogeneity. The relative percent differences for all detected metals were less than 10 as presented in QA/QC Table 20.

Sample 5720 was spiked with 1.0 ug/g mercury to determine any matrix effects. The recovery was 50% possibly due to complexing of the mercury with chlorides during sample digestion. The volatile organics analysis for this oil sample confirmed the presence of organochlorine compounds (See Table 5 of Section I, Results). Sample 5719 was spiked with arsenic and selenium and showed recoveries of 104% and 114%, respectively. Sample 1260 was spiked with a mixture of the ten remaining priority pollutant metals. All recoveries were within a range of 60%-125% except silver which had a recovery of 53%. This sample contained high concentrations of organochlorine compounds, possibly resulting in complexing of the silver and chlorine during digestion with subsequent precipitation. The results of these matrix spikes are presented in QA/QC Table 21.

QA/QC Table 22 presents the results of duplicate incineration parameters analyses. The relative percent differences did not exceed 15. The flashpoint testing was not performed in duplicate.

QA/QC Table 10. Surrogate Standard Recoveries for Volatile Organics in Water, Soil, and Oil

Sample No.	% Recovery Toluene-D8	% Recovery Bromofluorobenzene	% Recovery 1,2-Dichloroethane-D4
Water:			
5705	101	104	92
5706	101	101	96
5707	98	98	93
5708	98	102	87
5708 (MS)	96	99	89
5708 (MSD)	93	100	91
5709	98	99	88
5710	98	100	90
5711	98	103	92
5712	101	107	92
5713	102	108	92
5713 (MS)	98	101	94
5713 (MSD)	97	99	96
5714	99	98	88
5715	97	98	91
Soil:			
B-2 S-5	100	89	96
B-4 4-5	108	100	108
B-8 R-1 10-13	99	107	95
B-13 4.5-6	102	102	122
B-16 R-1 2.5	104	98	89
B-16 R-2 BOB (Dil 5X)	101	97	94
B-16 R-2 BOB	103	100	101
B-16 R-1 14	103	102	111
B-20 3-4.1	105	103	119
B-24 R-1	101	134	115
B-35 S-2	102	109	92
B-2 S-5 (MS)	96	93	80
B-2 S-5 (MSD)	99	94	81
Oil:			
1258	95	107	105
1260	95	106	106
1261	92	105	109
5719	101	100	109
5719 (MS)	98	103	108
5719 (MSD)	98	106	106
5720	95	106	106

QA/QC Table 11. Matrix Spike/Matrix Spike Duplicate Recoveries for Volatile Organics in Water

Concentrations reported in ug/L

All parameters spiked at 50 ug/L

Parameter	Sample	Recovered MS	Recovered MSD	% Recovery MS	% Recovery MSD	RPD
Sample No. 5708						
1,1-Dichloroethene	ND	33	32	66	64	3.1
Trichloroethene	ND	47	44	94	88	6.6
Chlorobenzene	ND	44	43	88	86	2.3
Toluene	ND	44	42	88	84	4.6
Benzene	ND	43	39	86	78	9.8
Sample No. 5713						
1,1-Dichloroethene	ND	49	49	98	98	0
Trichloroethene	ND	50	50	100	100	0
Chlorobenzene	ND	49	48	98	96	2.0
Toluene	ND	50	50	100	100	0
Benzene	ND	48	48	96	96	0

MS denotes matrix spike. MSD denotes matrix spike duplicate.
RPD denotes relative percent difference.
ND denotes not detected.

QA/QC Table 12. Matrix Spike/Matrix Spike Duplicate Recoveries for Volatile Organics in Soils

Concentrations reported in ug/kg

All parameters spiked at 50 ug/kg

Parameter	Sample Conc.	Recovered Conc.		% Recovery		RPD
		MS	MSD	MS	MSD	
Sample B-2 S-5						
1,1-Dichloroethene	ND	65.	67.	130	134	3.0
Trichloroethene	ND	53.	55.	106	110.	3.7
Chlorobenzene	ND	45.	52.	90.	104	14.
Toluene	ND	45.	49.	90.	98.	8.5
Benzene	5.*	44.	48.	78.	86.	11.

MS denotes matrix spike. MSD denotes matrix spike duplicate.
RPD denotes relative percent difference.
ND denotes not detected.
* denotes a value that is below the limit of quantification and considered approximate.

QA/QC Table 13. Matrix Spike/Matrix Spike Duplicate Recoveries for Volatile Organics in Oil

Concentrations reported in ug/g

All parameters spiked at 100 ug/g

Parameter	Sample Conc.	Recovered Conc.		% Recovery		RPD
		MS	MSD	MS	MSD	
Sample No. 5719						
1,1-Dichloroethene	ND	112	116	112	116	3.5
Trichloroethene	20.	118	129	98	109	11.
Chlorobenzene	ND	98	98	98	98	0
Toluene	33.	125	133	92	100	8.3
Benzene	ND	97.	100.	97.	100	3.0

MS denotes matrix spike, MSD denotes matrix spike duplicate.
RPD denotes relative percent difference.
ND denotes not detected.

QA/QC Table 14. Surrogate Standard Recoveries for Pesticides/PCBs in Water, Soil and Oil

Sample No.	Matrix	% Recovery Dibutylchlorendate
5705	Water	31.
5706	Water	23.
5707	Water	120
5709	Water	70
5709 MS	Water	120
5709 MSD	Water	129
5710	Water	46
5711	Water	20
5712	Water	100
5712 MS	Water	100
5712 MSD	Water	100
5713	Water	30
5714	Water	70
5715	Water	50
B-2 S-5	Soil	190
B-4 4-5	Soil	560
B-8 R-1 10-13	Soil	320
R-13 4.5-6	Soil	300
B-16 R-1 2.5	Soil	110
B-16 R-2 BOB	Soil	110
B-16 R-1 14	Soil	170
B-20 3-4.1	Soil	350
B-24 R-1 6.5-8.5	Soil	930
B-35 S-2 6.5-8.5	Soil	1380
B-16 R-2 BOB (MS)	Soil	130
B-16 R-2 BOB (DUP)	Soil	230
1258	Oil	100
1258 Duplicate	Oil	110
1258 MS	Oil	100
1260	Oil	320
1261	Oil	550
5719	Oil	270
5720	Oil	1330

MS denotes matrix spike, MSD denotes matrix spike duplicate.
DUP denotes duplicate.

QA/QC Table 15. Matrix Spike/Matrix Spike Duplicate Recoveries for Pesticides in Water

Concentrations reported in ug

All parameters spiked with .5 ug

Parameter	Sample Conc.	Recovered Conc. MS	Recovered Conc. MSD	% Recovery MS	% Recovery MSD	RPD
Sample No. 5712						
Dieldrin	ND	.62	.63	124	126	3.2
Endrin	ND	.74	.78	148	156	5.3
4,4'-DDT	ND	.93	.79	186	158	16.3
Sample No. 5709						
Dieldrin	ND	1.1	1.2	220	240	9.0
Endrin	ND	1.3	1.4	260	280	7.0
4,4'-DDT	ND	1.2	1.2	240	240	0

MS denotes matrix spike, MSD denotes matrix spike duplicate.
RPD denotes relative percent difference.
ND denotes not detected.

QA/QC Table 16. Matrix Spike Recoveries for Pesticides in Soil

Concentrations reported in ug

Parameter	Sample Conc.	Spike Conc.	Recovered Conc.	% Recovery
Sample No. B-16 R-2 BOB				
gamma-BHC	ND	0.80	0.78	98.
Heptachlor	ND	0.80	0.78	98.
Aldrin	ND	0.80	0.78	98.
Dieldrin	ND	2.0	2.0	100.
Endrin	ND	2.0	2.2	110.
4,4'-DDT	ND	2.0	3.1	155.

ND denotes not detected.

QA/QC Table 17. Matrix Spike Recoveries for Pesticides in Oil

Concentrations reported in total ug

Parameter	Sample Conc.	Spike Conc.	Recovered Conc.	% Recovery
Sample No. 1258				
Lindane	ND	2.0	2.2	110
Heptachlor	ND	2.0	1.9	95
Aldrin	ND	2.0	2.3	115
Dieldrin	ND	5.0	6.1	122
Endrin	ND	5.0	6.2	124
4,4'-DDT	ND	5.0	7.6	154

ND denotes not detected.

QA/QC Table 18A. Surrogate Standard Recoveries for Base Neutral Extractables

Sample No.	% Recovery Nitrobenzene-D4	%Recovery 2-Fluorobiphenyl	% Recovery p-Terphenyl-D14
1258	88.	60	78
1260	83	59	68
1261	89	69	65
1261 Dup	95	90	64
1261 MS	92	84	56
5719	316	180	220
5720	94	63	82

MS denotes matrix spike.

QA/QC Table 18B. Surrogate Standard Recoveries for Acid Extractables

Sample No.	% Recovery 2-Fluorophenol	% Recovery Phenol-D5	% Recovery 2,4,6-Tribromophenol
1258	79.	80.	86
1260	79.	79.	81
1261	87.	85.	96
1261 Dup	80.	78	95
1261 MS	90.	81.	102.
5719	148.	208.	122.
5720	89.	89.	84.

MS denotes matrix spike.

QA/QC Table 19. Matrix Spike Recoveries for Base Neutral/Acid Extractables in Oil

Concentrations reported in ug/ml

Parameter	Sample Conc.	Spike Conc.	Recovered Conc.	%Recovery
Sample 1261				
1,2,4-Trichlorobenzene	ND	100.	80.	80.
Acenapthene	ND	100.	77.	77.
2,4-Dinitrotoluene	ND	100.	97.	97.
Pyrene	ND	100.	55.	55.
N-nitrosodi-n-propylamine	ND	100.	68.	68.
1,4-Dichlorobenzene	ND	100.	61.	61.
Pentachlorophenol	ND	200.	192	96.
Phenol	ND	200.	131	66.
2-Chlorophenol	ND	200.	132	66.
4-Chloro-3-methylphenol	ND	200.	161	80.
4-Nitrophenol	ND	200.	162	81.

ND denotes not detected.

QA/QC Table 20. Duplicate Metals in Oil Analyses

Concentrations reported in ug/g

Parameter	Run 1	Run 2	RPD
Sample No. 1261			
Antimony	ND	ND	---
Beryllium	ND	ND	---
Cadmium	0.66	0.66	0
Chromium	14.1	15.	6.2
Copper	13.7	14.	2.2
Lead	136.	134.	1.5
Nickel	2.9	2.7	7.1
Silver	ND	ND	---
Thallium	ND	ND	---
Zinc	147.	146.	0.7

RPD denotes relative percent difference.
ND denotes not detected.

QA/QC Table 21. Matrix Spike Recoveries for Metals in Oil

Concentrations in ug/g

Parameter	Sample Conc.	Spike Conc.	Recovered Conc.	% Recovery
Sample No. 1260				
Antimony	ND	100.	67.8	67.8
Beryllium	ND	50.	46.7	93.4
Cadmium	0.64	50.	37.5	73.7
Chromium	76.6	50.	139	125
Copper	3.3	100.	91.1	87.8
Lead	25.8	100.	89.4	63.6
Nickel	4.3	100.	84.7	80.4
Silver	ND	50.	26.6	53.2
Thallium	ND	100.	73.4	73.4
Zinc	63.6	100.	158.	94.4
Sample No. 5719				
Arsenic	ND	2.5	2.6	104
Selenium	ND	5.0	5.7	114
Sample No. 5720				
Mercury	ND	1.0	.5	50.

ND denotes not detected.

QA/QC Table 22. Duplicate Analyses for Incineration Parameters

Parameter	Sample No.	Run 1	Run 2	Difference	RPD
% Ash	1258	0.27	0.24	0.03	12.
TOX (% as Cl)	1260	0.55	0.57	0.02	3.6
BTU/pound	1260	15,300	15,300	0.0	0.0

RPD denotes relative percent difference.